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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,072	01/19/2001	Hisham S. Abdel-Ghaffar	2925-0502P	6788

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EXAMINER	
CONNOLLY, MARK A	
ART UNIT	**PAPER NUMBER**
2115	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/764,072	ABDEL-GHAFFAR, HISHAM S.	
	Examiner	Art Unit	
	Mark Connolly	2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-11 have been presented for examination.

SUMMARY OF THE APPEALS BOARD DECISION

2. The Appeals Board stated, "[t]he claimed 'converting the received downlink and uplink timing information to a continuous time scale' does not require the specifics of the disclosed examples of operating on time stamp values individually" wherein the "system converts timing information to 'a continuous time scale' by adding a predetermined number (Tf) to a time stamp value in the event of a wraparound with respect to the periodic timing scale." Although applicant stated that "the position of the Appeals Board was that the claims could read upon Premerlani because temporal relationship was not explicitly claimed," it should be noted that both statements are equivalent. In particular, applicant's invention calculates a time offset by performing a series of steps. The Appeals Board decision implied that the compensation for wraparound does not have to be performed explicitly on the downlink and uplink timing information before determining the time offset and instead can be performed during a later step as is done in Premerlani. The interpretation that the wraparound compensation can occur in another step is the temporal relationship with which the applicant refers to.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Premerlani US Pat No 5958060 as cited in the previous Office actions.

5. Referring to claim 1, Premerlani teaches the method of determining a time offset between a central node and a secondary node comprising:

a. receiving, at a central node, downlink and uplink timing information from a secondary node, the downlink and uplink timing information based on a periodic timing scale, the downlink timing information representing timing information for communication from the central node to the secondary node and the uplink information representing timing information for communication from the secondary node to the central node [col. 5 lines 51-62 and col. 6 lines 13-24]. Terminals 1 and 2 are interpreted as central and secondary nodes respectively. The delay between the central node and secondary node is interpreted as downlink information and the delay between the secondary node and central node is interpreted as downlink information.

b. converting the received downlink and uplink timing information to a continuous time scale [col. 6 lines 20-24]. Roll over occurs when a time scale is periodic and performing calculations to compensate for roll over is interpreted as converting from a periodic time scale to a continuous time scale.

c. determining, only after the converting step, a time offset estimate between the central node and the secondary node based on the converted downlink and uplink timing information [col. 6 lines 13-24]. As is shown below, the converted uplink and downlink timing information is required for determining the time offset. Therefore the determining step inherently must occur after the converting step.

In particular, Premerlani records four timestamps T_{i-3}, T_{i-2}, T_{i-1} and T_i with each timestamp representing a counter value. Because the counter can wraparound (i.e. making the counter periodic), it is interpreted that the timestamps derived from the counter exist on a periodic time scale in accordance with the counter from which the timestamps are measured. Next, Premerlani teaches calculating a delay between terminals 1 and 2 and a delay between terminals 2 and 1 or in other words, a downlink and uplink delay time. Calculating the downlink and uplink delay values comprise finding a difference between the timestamp values (i.e. downlink time = $T_{i-3} - T_{i-2}$ and uplink time = $T_{i-1} - T_i$). This process converts the periodic timing information (i.e. distinct points in time represented by the timestamps) into values that represent a delay time or time duration. The examiner notes that claim 1 does not define that the downlink and uplink timing information must wraparound in order to convert the downlink and uplink timing information into a continuous time scale as is recited in claim 11. Therefore, calculating a delay between points based on a periodic scale (i.e. the downlink and uplink timing information) can be interpreted as "converting the received downlink and uplink timing information to a continuous scale" because the delay values which represent the delay between the both the downlink and uplink timing information represent a continuous time within the periodic time scale and therefore can be interpreted as existing in a continuous time scale.

For example, assume the counter in Premerlani can count to 10 before wraparound. Measuring the four timestamps T_{i-3}, T_{i-2}, T_{i-1} and T_i it can be seen in Fig. 1 that each timestamp represents a value within periodic time period.

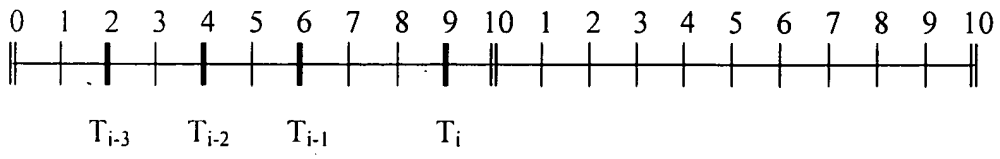

Fig. 1

Next, when calculating both the downlink and uplink times, (i.e. converted downlink and uplink timing information) the delay between the timestamps represented by Δd for the converted downlink timing information and Δu for the converted uplink timing information represents a continuous time period as can be seen in Fig. 2.

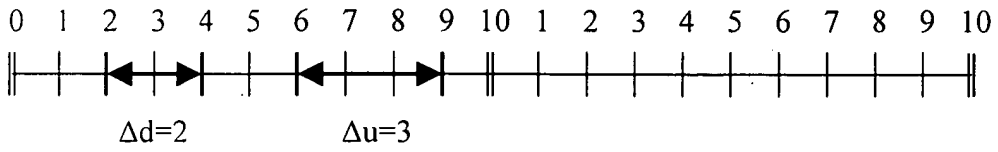

Fig. 2

Finally, both Δd and Δu are added to calculate a round trip delay herein interpreted as a time offset between the central and secondary nodes.

6. Referring to claims 2-4 and 7, Premerlani teaches using transmit and receive timestamps in order to calculate uplink and downlink information in order to determine the time offset between the two nodes [col. 5 lines 51-62 and col. 6 lines 13-24]. In particular, the Premerlani system begins with the central node recording a transmit timestamp Ti-3 and sending it to the secondary node. Upon reception, the secondary node records a receive timestamp Ti-2 and then saves timestamps Ti-3 and Ti-2 as timestamps Ti-1 and Ti respectively. Next, the secondary node records a new transmit timestamp as Ti-2 and sends all timestamps back to the central node. Finally, the central node records a new receive timestamp as Ti-3 and calculates the uplink and downlink information, converting to compensate for any wrap around or roll over if necessary, in order to determine the time offset between the central and secondary node.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Premerlani.

8. Referring to claim 11, Premerlani teaches a method of determining a time offset estimate between a central node and a secondary node, comprising:

d. receiving, at a central node, downlink and uplink timing information from a second node, the downlink and uplink timing information based on a periodic timing scale, the downlink timing information representing timing information for communication from the central node to the secondary node and the uplink information representing timing information for communication from the secondary node to the central node [col. 5 lines 51-62 and col. 6 lines 13-24].

e. adjusting the received downlink and uplink timing information for time wraparound [col. 6 lines 20-24]. Roll over is interpreted as wraparound.

f. determining a time offset estimate between the central node and the second node based on the adjusted downlink and uplink timing information [col. 6 lines 13-24].

Although Premerlani teaches determining a time offset, it is not explicitly taught that the time offset is determined only after the adjusting step which adjusts the uplink and downlink timing information for time wraparound. Rather, Premerlani suggests that the time offset is determined then compensated for time wraparound.

There are well known inherent algebraic concepts known as the commutative and associative properties. In particular, the commutative property simply states that:

"A + B = B + A" or that:

"A + B + C = A + C + B = B + A + C = B + C + A = C + A + B = C + B + A"

In addition there is also the associative property, which simply states that:

"A + (B + C) = (A + B) + C"

In other words, both the commutative and associative properties together state that calculations can be performed in any order and yield the same result.

When Premerlani calculates round trip delay, which also requires compensation for wrap around, the process occurs as follows:

1) both an uplink (UL) and downlink (DL) values are determined.

2) the UL and DL are added to determine round trip delay (RTD)

3) the RTD is compensated for wrap around (RTD') by adding and/or subtracting predetermined values from the RTD. It should be noted that wrap around can occur with *any* of the timestamps as stated by Premerlani [col. 6 lines 22-23].

This can be expressed as found in the following equations:

"UL + DL = RTD"

"RTD' = RTD + X – Y" (where X and Y are values used to compensate for wrap around when Ti-3 > Ti and Ti-2 > Ti-1 respectively)

Therefore it should be apparent that:

"RTD' = (UL + DL) + X – Y" which can be rewritten as:

"RTD' = (UL + DL) + X + (–Y)"

Applying both the commutative and associative properties it is obvious that the above equation can be expressed as:

"RTD' = (UL + X) + (DL + (–Y))" or "RTD' = (UL + (-Y)) + (DL + X)"

In other words, when calculating a compensated round trip delay (RTD'), the uplink and downlink times can be adjusted for wrap around, rather than the RTD value, and still yield the same answer.

In addition, Premerlani suggests that compensating for wraparound is not limited to being performed in any one particular step. In particular, Premerlani discusses the steps used to determine both an RTD and time offset. After an UL and DL timing is determined, the values are used to calculate the RTD. Next, the RTD is used to calculate the time offset. When the system compensates for time wraparound, it is taught that the RTD can be compensated for wraparound regardless of whether or not the time offset has been compensated. On the other hand, Premerlani also teaches that the time offset can be compensated for regardless of whether or not the RTD was compensated [col. 6 lines 23-34]. In summary, calculating the time offset requires calculating the RTD and any wraparound can be accounted for in either step. This proves that wraparound compensation is not step dependent and it therefore would have been obvious to one of ordinary skill in the art that since determining the RTD requires calculating the UL and DL times, wraparound compensation could be applied to the UL and DL times as well.

Although the reference patent does not teach the subject matter exactly as claimed, both systems operate "on basically the same principle and in the same manner" wherein the differences, in addition to being well known, "solves no stated problem and would be an obvious matter of design choice within the skill of the art" and therefore obvious variations of one

another and thus not patentably distinct. See *In re Kuhle*, 188 USPQ 7 (CCPA 1975).

Additionally, it appears that the applicant has amended claim 11 to include obvious teachings solely to get around the Premerlani reference rather then amending to include novel subject matter. The specification does not explicitly point out that the claimed order is critical in determining the time offset between the central and secondary node. Although an order is shown in the specification, it is not explicitly taught that the particular order relied on by applicant is critical to the success of the invention or that the order is the only order possible to reach the correct end result. If indeed the particular order was critical in determining the time offset then it should have been identified in the specification as being so. See *Lincoln Engineering Company of Illinois* v. *Stewart-Warner Corporation*, 37 USPQ 1 (U.S. 1938).

It would have been obvious to one of ordinary skill in the art to modify the Premerlani system to calculate the time offset using adjusted uplink and downlink timing information rather than compensating for the wrap around time by adjusting the time offset value because one of ordinary skill would understand the above algebraic knowledge and reasoning provided above and understand that both are calculations are obvious variants of one another which yield identical results.

9. Claims 5-6, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Premerlani as applied to claims 1-4, 7 above, and further in view of Thornberg et al [Thornberg] US Pat No 5757772 as cited in the previous Office actions.

10. Referring to claim 5, Premerlani does not explicitly teach calculating a plurality of uplink and downlink times. Thornberg teaches calculating a plurality of uplink and downlink delays in

order to find an average uplink and downlink delay [col. 20 lines 15-22]. It would have been obvious to one of ordinary skill in the art to realize the benefit measuring a plurality of uplink and downlink delays because as it is well known, delay times can vary between transmissions and by measuring multiple delays, a more accurate estimate of uplink and downlink delays can be obtained.

11. Referring to claim 6, Premerlani teaches determining a minimum round trip delay which would obviously derive from a minimum uplink and downlink delay [col. 5 lines 28-32].

12. Referring to claim 8, Thornberg teaches setting a timeout period to determine if data has been lost in transmission [col. 6 lines 2-5].

13. Referring to claim 10, Thornberg teaches a cellular communications system in which a mobile device communicated with a radio network controller [col. 3 line 64 – col. 4 line 1, col. 3 lines 7-16 and 42-45].

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Connolly whose telephone number is (571) 272-3666. The examiner can normally be reached on M-F 8AM-5PM (except every first Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on (571) 272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mark Connolly
Examiner
Art Unit 2115

mc
February 23, 2007

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SUPERVISORY PATENT EXAMINER
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